# 2. Alignment and Adjustments

## 2-1 General Alignment Instructions

1. Usually, a color TV-VCR needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. Observe the picture for good black and white details. There should be objectionable color shading; if color shading is present, demagnetize, perform purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent.

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

## 2-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set is moved or turned in a different direction, the power should be OFF for at least 10 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before turning power OFF.

If color shading persists, perform the following Color purity and Convergence adjustments.

## 2-3 High Voltage Check

**CAUTION : There is no high voltage adjustment on this chassis. The B+ power supply should be +135 volts (with full color- bar input and normal picture level).**

1. Connect a digital voltmeter to the second anode of the picture tube.

2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).

3. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 30 KV under any conditions.

## 2-4 FOCUS Adjustment

1. Iput a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

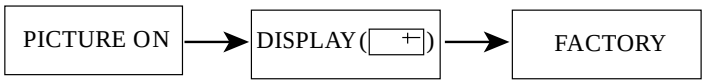
## 2-5 Factory Adjustment

### 2-5-1 Service Mode

1. To enter the "Service Mode", Press the remote-control keys in this sequence :

   - If you do not have Factory remote-control

   - If you have Factory remote-control



## 2-5-2 Factoy Mode OSD

2-5-2(A) ADJUST

✳ **TDA959X**

**ADJUST**
OPTION
OPTION1
G2-ADJUST
RESET
SPM-836EE1

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AGC | FIX | 30 | STT | FIX | 7 | PWL | FIX | 12 | HPAR | Adjust | 32 |
| SCT | Adjust | 13 | AKB | FIX | 0 | AGN | FIX | 1 | HBOW | Adjust | 32 |
| SBT | Adjust | 10 | PDL | FIX | 15 | PEK | FIX | 2 | EWID | Adjust | 32 |
| BLR | Adjust | 30 | NDL | FIX | 10 | ACL | FIX | 0 | EPAR | Adjust | 32 |
| BLB | Adjust | 30 | PSR | FIX | 15 | FCO | FIX | 0 | EUCN | Adjust | 32 |
| RG | Adjust | 30 | NSR | FIX | 5 | SCBT | FIX | 45 | ELCN | Adjust | 32 |
| GG | FIX | 30 | VOL | FIX | 10 | TSC | FIX | 40 | ETRP | Adjust | 32 |
| BG | Adjust | 30 | LCO | FIX | 0 | SSP | FIX | 15 | VZ | FIX | 54 |
| VSL | FIX | 22 | TXP | FIX | 9 | PSNS | FIX | 1 | FOAB | FIX | 0 |
| VS | Adjust | 25 | MVOL | FIX | 5 | DPSR | FIX | 15 | | | |
| VA | Adjust | 43 | FMWS | FIX | 0 | DNSR | FIX | 15 | | | |
| HS | Adjust | 37 | AGCS1 | FIX | 1 | DCDL | FIX | 13 | | | |
| SC | FIX | 28 | OMD | FIX | 26 | SVM | FIX | 0 | | | |
| CDL | FIX | 13 | SCL | FIX | 1 | VMA | FIX | 3 | | | |

| OSD | Range | Register | Initial Value | Remark |
|---|---|---|---|---|
| AGC | 0 ~ 63 | 1Eh(D5-D0) | 30 | RF AGC |
| SCT | 0 ~ 23 | 1Dh | 13 | Sub contrast(high light adjustment) |
| SBT | 0 ~ 23 | 1Bh | 10 | Sub brightness(low light adjustment) |
| BLR | 0 ~ 63 | 14h(D5-D0) | 30 | Black level offset R(low light R adjustment) |
| BLB | 0 ~ 63 | 15h(D5-D0) | 30 | Black level offset B(low light B adjustment) |
| RG | 0 ~ 63 | 16h(D5-D0) | 30 | White point R(high light R adjustment) |
| GG | 0 ~ 63 | 17h(D5-D0) | 30 | White point G(high light 25 fixed) |
| BG | 0 ~ 63 | 18h(D5-D0) | 30 | White point B(high light B adjustment) |
| VSL | 0 ~ 63 | 0Fh(D5-D0) | 22 | Vertical slope |
| VS | 0 ~ 63 | 12h(D5-D0) | 25 | Vertical shift |
| VA | 0 ~ 63 | 10h(D5-D0) | 43 | Vertical amplitude |
| HS | 0 ~ 63 | 09h(D5-D0) | 37 | Horizontal shift |
| SC | 0 ~ 63 | 0Fh(D5-D0) | 28 | S-correction |
| CDL | 0 ~ 15 | 2Ah(D3-D0) | 13 | Cathode drive level |
| STT | 0 ~ 7 | 08h | 7 | Sub tint(NTSC only) |
| AKB | 0 ~ 1 | 2Ah(D4) | 0 | Black current stabilization |
| PDL | 0 ~ 15 | 1Ah(D3-D0) | 15 | PAL Y-delay adjustment |
| NDL | 0 ~ 15 | 1Ah(D3-D0) | 10 | NTSC Y-delay adjustment |
| PSR | 0 ~ 23 | 1Ch | 15 | PAL sub color gain adjustment |
| NSR | 0 ~ 23 | 1Ch | 5 | NTSC sub color gain adjustment |
| VOL | 0 ~ 63 | 1Fh | 10 | Initial vol adjustment |
| LCO | 0 ~ 1 | 27h(D7-D5) | 0 | PLL demodulator frequency adjust( 0 : set ) |
| TXP | 0 ~ 15 | 87F2h(D5-D0) | 9 | TTX horizontal shift adjustment(Micom Memory Part) |
| MVOL | 0 ~ 50 | Oh(D15-D0) | 5 | Melody initial vol adjustment(MSP34XX) |
| FMWS | 0 ~ 1 | 29h(D5) | 0 | Narrow-band sound PLL window selection |
| AGCS1 | 0 ~ 3 | 28h(D2-D1) | 1 | IF AGC speed |
| OMD | 0 ~ 63 | 05h(D5-D0) | 26 | Off-set IF demodulator |
| SCL | 0 ~ 3 | 04h(D5-D4) | 1 | Soft clipping level |
| PWL | 0 ~ 15 | 04h(D3-D0) | 12 | Peak white limiting |
| AGN | 0 ~ 1 | 29h(D7) | 1 | FM demodulator gain |
| PEK | 0 ~ 3 | 19h(D7-D6) | 2 | Peaking center frequency |
| ACL | 0 ~ 1 | 20h(D1) | 0 | Automatic color limiting |
| FCO | 0 ~ 1 | 21h(D0) | 0 | Forced color limiting |
| SCBT | 0 ~ 63 | 1Bh | 40 | Screen brightness(different from INCH) |
| TSC | 0 ~ 23 | 19h(D5-D0) | 40 | Sub Sharpness gain adjustment |

| OSD | Range | Register | Initial Value | Remark |
|---|---|---|---|---|
| SSP | 0 ~ 23 | 21h(D2) | 15 | Ident sensitivity PAL/NTSC decoder |
| PSNS | 0 ~ 1 | 06h(D5-D0) | 1 | Horizontal parallelogram |
| DPSR | 0 ~ 63 | 07(D5-D0) | 15 | Horizontal bow |
| DNSR | 0 ~ 63 | 0Ah(D5-D0) | 10 | EW width |
| DCDL | 0 ~ 63 | 0Bh(D5-D0) | 13 | EW parabola |
| SVM | 0 ~ 63 | 0Ch(D5-D0) | 0 | EW upper corner parabola |
| VMA | 0 ~ 63 | 0Dh(D5-D0) | 3 | EW lower corner parabola |
| HPAR | 0 ~ 63 | 0Eh(D5-D0) | 32 | EW tarpezium |
| HBOW | 0 ~ 63 | 13h(D5-D0) | 32 | Vertical zoom |
| EWID | 0 ~ 3 | 2Dh(D5-D0) | 32 | Delay of RGB output to VM output |
| EPAR | 0 ~ 3 | 2Eh(D5-D0) | 32 | Ampulitude of SVM out |
| EUCN | 0 ~ 23 | 1Ch | 32 | DVD PAL sub color gain adjustment |
| ELCN | 0 ~ 23 | 1Ch | 32 | DVD NTSC sub color gain adjustment |
| ETRP | 0 ~ 23 | 1Bh | 32 | DVD Sub brightness(low light adjustment) |
| VZ | 0 ~ 15 | 2Ah(D3-D5) | 54 | DVD Cathode drive level |
| FOAB | 0 ~ 63 | 14h(D5-D0) | 0 | DVD Black level offset R(low light R adjustment) |

## 2-5-2(B) OPTION

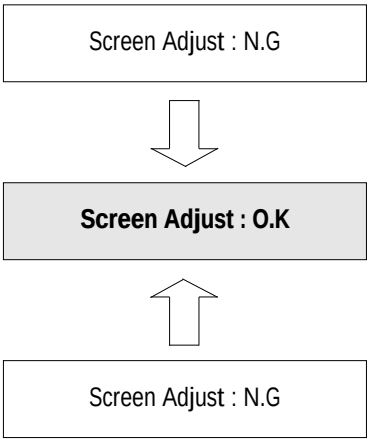
ADJUST
**OPTION xx xx xx**
G2-ADJUST
RESET
SPM-836EE1

| No | Item | Initial value | Remarks |
|---|---|---|---|
| 1 | LNA | ON | CIS : ON , OTHER : OFF |
| 2 | SYSTEM | CS | |
| 3 | AUDIO | STEREO | L-STEREO/STEREO /NICAM |
| 4 | EQUALIZER | ON | FIX : ON |
| 5 | JACK | SCART | RCA/SCART/RCA+DVD |
| 6 | AV ZOOM | NOR/ZOOM/16:9 | FIX |
| 7 | AUTO POWER | ON | FIX : ON |
| 8 | EW | ON | FIX : ON |
| 9 | AUTO FM | ON | FIX : ON |
| 10 | HOTEL MODE | OFF | OPTION |
| 11 | BL STRETCH | ON | FIX : ON |
| 12 | HIGH DEVLA | OFF | OPTION |
| 13 | HELP MENU | ON | OPTION |
| 14 | LIST/FLOF | FLOF | FIX : ON |
| 15 | TIME | ON | OPTION |
| 16 | V-GUARD | OFF | FIX : OFF |
| 17 | TILT | OFF | FIX : OFF |
| 18 | DOLBY | OFF | FIX : OFF |

## 2-5-2(C) G2-ADJUST

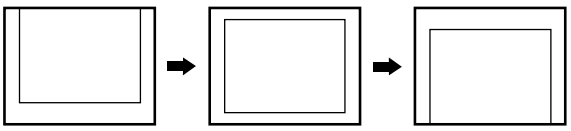
ADJUST
OPTION xx xx xx
**G2-ADJUST**
RESET
SPM-836EE1

☞ Entering G2-Adjust Mode Screen Adjust : Displyed As “NG”.
→ Turn SCREEN VR OF FBT, Adjust Value Become To Be “OK”.

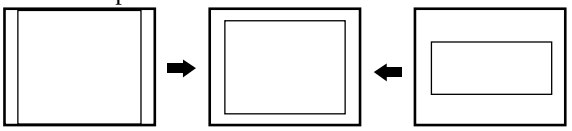


2-5-2(D) SCREEN CHANGE (I2C BUS GEOMETRIC ADJUSTMENT)

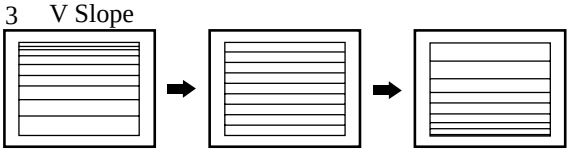
1 V Shift



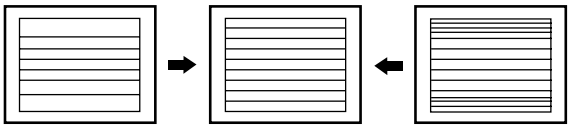
2 V Amp



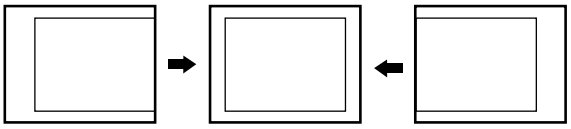
3 V Slope



4 V SC



5 H Shift



## 2-6 PIN ASSIGNMENT SPECIFICATION

| PIN NO | SYMBOL | PIN FUNCTION | CHECK VOLTAGE | |
|---|---|---|---|---|
| | | | S-By | P-On |
| 1 | P1.3/T1 | port 1.3 or Counter/Timer 1 input | | |
| 2 | P1.6/SCL | port 1.6 or IIC-bus clock line | | |
| 3 | P1.7/SDA | port 1.7 or IIC-bus data line | | |
| 4 | P2.0/TPMW | port 2.0 or Tuning PWM output | | |
| 5 | P3.0/ADC0 | port 3.0 or ADC0 input | | |
| 6 | P3.1/ADC1 | port 3.1 or ADC1 input | | |
| 7 | P3.2/ADC2 | port 3.2 or ADC2 input | | |
| 8 | P3.3/ADC3 | port 3.3 or ADC3 input | | |
| 9 | VSSC/P | digital ground for m-Controller core and periphery | | |
| 10 | P0.5 | port 0.5(8mA current sinking capability for direct drive of LEDs) | | |
| 11 | P0.6 | port 0.6(8mA current sinking capability for direct drive of LEDs) | | |
| 12 | VSSA | digital ground of TV-processor | | |
| 13 | SECPLL | SECAM PLL decoupling | | |
| 14 | VP2 | 2nd supply voltage TV-processor(+8V) | | |
| 15 | DECDIG | supply voltage decoupling of digital circuit of TV-processor | | |
| 16 | PH2LF | phase-2 filter | | |
| 17 | PH1LF | phase-1 filter | | |
| 18 | GND3 | ground 3 for TV-processor | | |
| 19 | DECBG | bandgap decoupling | | |
| 20 | EWD | East-West drive output | | |
| 21 | VDRB | vertical drive B output | | |
| 22 | VDRA | vertical drive A output | | |
| 23 | IFIN1 | IF input 1 | | |
| 24 | IFIN2 | IF input 2 | | |
| 25 | IREF | reference current input | | |
| 26 | VSC | vertical sawtooth capacitor | | |
| 27 | AGCOUT | tuner AGC output | | |
| 28 | SIFIN1/DVBIN1 | SIF input 1 / DVB input 1 | | |
| 29 | SIFIN2/DVBIN2 | SIF input 2 / DVB input 2 | | |
| 30 | GND2 | ground 2 for TV processor | | |
| 31 | SIFAGC/DVBAGCR | narrow band PLL filter | | |
| 32 | REFO/AMOUT/REFIN | Automatic Volume Leveling/subcarr reference output/sound IF input/external reference signal input for I signal mixer for DVB operation | | |

| PIN NO | SYMBOL | PIN FUNCTION | CHECK VOLTAGE | |
|---|---|---|---|---|
| | | | S-By | P-On |
| 33 | HOUT | horizontal output | | |
| 34 | FBISO | flyback input/sandcastle output | | |
| 35 | QSSO/AMOUT | QSS intercarrier output/AM output in stereo applications or deemphasis(front-end audio out)/AM output in mono applications | | |
| 36 | EHTO | EHT/overvoltage protection input | | |
| 37 | PLLIF | IF-PLL loop filter | | |
| 38 | IFVO/SVO/DVBO | AGC sound IF/inter-external AGC for DVB applications | | |
| 39 | VP1 | main supply voltage TV processor | | |
| 40 | CVBS1 | internal CVBS input | | |
| 41 | GND | ground for TV processor | | |
| 42 | CVBS/Y | CVBS3/Y input | | |
| 43 | C | chroma input | | |
| 44 | SVM | scan velocity modulation output | | |
| 45 | INSSW2 | 2nd RGB/YUV insertion input | | |
| 46 | R2/VIN | 2nd R input/V(R-Y) input PR input | | |
| 47 | G2/YIN | 2nd G input/Y input | | |
| 48 | B2/UIN | 2nd B input/U(B-Y) input PB input | | |
| 49 | BCLIN | beam current limiter input | | |
| 50 | BLKIN | black current input/V-guard input | | |
| 51 | RO | Red output | | |
| 52 | GO | Green output | | |
| 53 | BO | Blue output | | |
| 54 | VDDA | analog supply of Teletext decoder and digital supply of TV-processor(3.3 V) | | |
| 55 | VPE | OTP Progamming Voltage | | |
| 56 | VDDC | digital supply to core(3.3 V) | | |
| 57 | OSCGND | oscillator ground supply | | |
| 58 | XTLIN | crystal oscillator input | | |
| 59 | XTLOUT | crystal oscillator output | | |
| 60 | RESET | reset | | |
| 61 | VDDP | digital supply to peryipher(+3.3 V) | | |
| 62 | P1.0/INT1 | port 1.0 or external interrupt 1 input | | |
| 63 | P1.1/T0 | port 1.1 or Counter/Timer 0 input | | |
| 64 | P1.2/INTO | port 1.2 or external interrupt 0 input | | |

## 2-7 Main Adjustment Parameter(TDA 93XX)

### ✳ TDA93XX(IC201S)

| OSD | FUNCTION | RANGE | INITIAL DATA | REMARK |
|---|---|---|---|---|
| AGC | Automatic Gain Control | 0 ~ 63 | 30 | |
| SCT | Sub Contrast | 0 ~ 23 | 13 | |
| SBT | Sub Brightness | 0 ~ 23 | 9 | |
| BLR | Black Level offset Red | 0 ~ 63 | 31 | |
| BLB | Black Level offset Blue | 0 ~ 63 | 27 | |
| RG | Red Gain | 0 ~ 63 | 32 | |
| GG | Green Gain | 0 ~ 63 | 32(Fix) | |
| BG | Blue Gain | 0 ~ 63 | 31 | |
| VSL | Vertical Slope | 0 ~ 63 | 30 | |
| VS | Vertical Shift | 0 ~ 63 | 35 | |
| VA | Vertical Amplitude | 0 ~ 63 | 42(Fix) | |
| HS | Horizontal Shift | 0 ~ 63 | 30 | |
| SC | S-Correction | 0 ~ 63 | 28(Fix) | |
| CDL | Cathode Drive Level | 0 ~ 15 | 9 | |
| STT | Sub Tint | 0 ~ 7 | 7(Fix) | |
| AKB | Black Current Stabilisation | 0 ~ 1 | 0(Fix) | |
| PDL | PAL Delay | 0 ~ 15 | 1(Fix) | |
| NDL | NTSC Delay | 0 ~ 15 | 10(Fix) | |
| PSR | PAL Sub Color | 0 ~ 23 | 10(Fix) | |
| NSR | NTSC Sub color | 0 ~ 23 | 10(Fix) | |
| VOL | Volume pre setting | 0 ~ 63 | 10(Fix) | |
| LCD | SECAM-L Vision IF | 0 ~ 1 | Option | CF MODEL : 1, others : 0 |
| TXP | TTX Position | 0 ~ 15 | 9(Fix) | |
| MVOL | Melody Volume Levle | 0 ~ 50 | 10(Fix) | |
| FMWS | Window Selection of Narrow SoundPLL | 0 ~ 1 | 0(Fix) | |
| AGCS | IF AGC Speed | 0 ~ 3 | 1 | CF MODEL : 0, others : 1 |
| OMD | Off-set IF Demodulator | 0 ~ 63 | 26(Fix) | |
| SCL | Soft Clipping Levle | 0 ~ 3 | 1(Fix) | |
| PWL | Peak White Limiting | 0 ~ 15 | 12(Fix) | |
| AGN | Gain FM Demodulator | 0 ~ 1 | 1(Fix) | |
| PEK | Peaking Centre Frequency | 0 ~ 3 | 2(Fix) | |
| ACL | Automatic Color Limiting | 0 ~ 1 | 1(Fix) | |
| FCO | Forced Color On | 0 ~ 1 | 0(Fix) | |
| SCBT | Screen Adjust Bright Value | 0 ~ 63 | 45(Fix) | |
| TSC | TTX Mix Mode Sub Contrast | 0 ~ 63 | 20(Fix) | TTX Option |
| SSP | Ident Sensitivity PAL/NTSC decoder | 0 ~ 23 | 20(Fix) | |
| PSNS | Horizontal parallelogram. | 0 ~ 1 | 1(Fix) | |

NOTE : PVS,PVA, PHS, parameters must be aligned using the 50Hz vertical-field rates.

## 2-8 Option Bytes(TDA 93XX)

In the Service Mode, various can be selected via the Option Table. Example:

✳TDA93XX (IC201S)

| | | SPM-802XX | REMARK |
|---|---|---|---|
| 1 | LNA | ON/OFF | CIS : ON Others : OFF |
| 2 | SYSTEM | CS/CZ/CF/CB/CI | OPTION |
| 3 | AUDIO | MONO/L-STEREO/STEREO/NICAM | OPTION |
| 4 | JACK | RCA/SCART | OPTION |
| 5 | ZOOM | NOR/ZOOM/16"9 | FIX : NOR/ZOOM |
| 6 | AUTO POWER | ON/OFF | FIX : ON |
| 7 | AUTO FM | ON/OFF | FIX : ON |
| 8 | 2ND SIF | ON/OFF | OPTION |
| 9 | HOTEL MODE | ON/OFF | OPTION |
| 10 | BKS | ON/OFF | FIX : ON |
| 11 | HIGH DEVIA | ON/OFF | OPTION |
| 12 | HELP MENU | ON/OFF | FIX : ON |
| 13 | LIST/FLOF | FLOF/LIST | OPTION |
| 14 | TIME | ON/OFF | OPTION |
| 15 | V-GUARD | ON/OFF | FIX : OFF |

✳ TDA93XX/TDA959X PIN Diffrence

| IC ver sion | FM-PLL ver sion (TDA93XX) | | | | QSS ver sion (TDA959X) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| East-W est Y/N | N | | Y | | N | | | Y | | |
| Pin 20 | AVL | | EWD | | AVL | | | EWD | | |
| Pin 28 | AUDEEM | | | | SIFIN1 | | | | | |
| Pin 29 | DECSDEM | | | | SIFIN2 | | | | | |
| Pin 31 | SNDPLL | | | | SIF AGC | | | | | |
| Pin 32 | SNDIF | REFO | AVL/SNDIF | REFO | AMOUT | REFO | | AMOUT | REFO | |
| Pin 35 | AUDEXT | | | | AUDEXT | QSSO | AMOUT | AUDEXT | QSSO | AMOUT |
| Pin 44 | AUDOUT | | | | controlled AM or audio out | | | | | |

# MEMO